

Jan. 27, 1953

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2,626,704

SHIPPING CONTAINER FOR REFRIGERATION SYSTEMS

Filed June 9, 1949

2 SHEETS—SHEET 1

FIG. 2

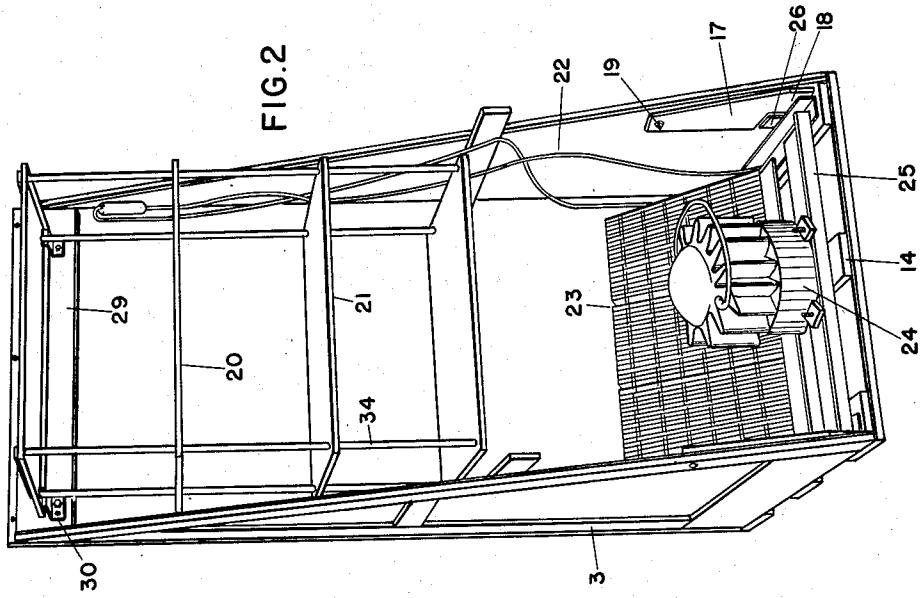
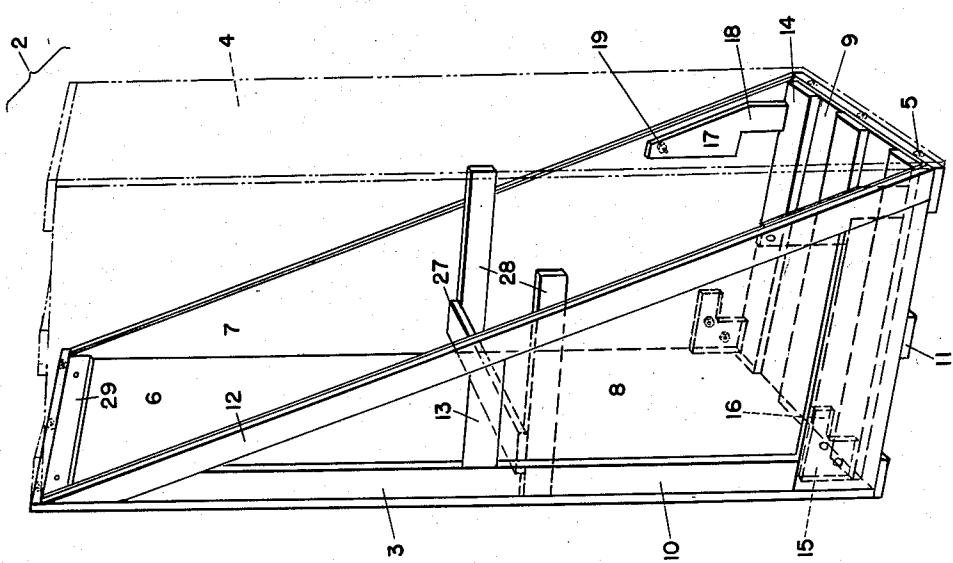


FIG. 1



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2 SHEETS—SHEET 2

FIG. 5

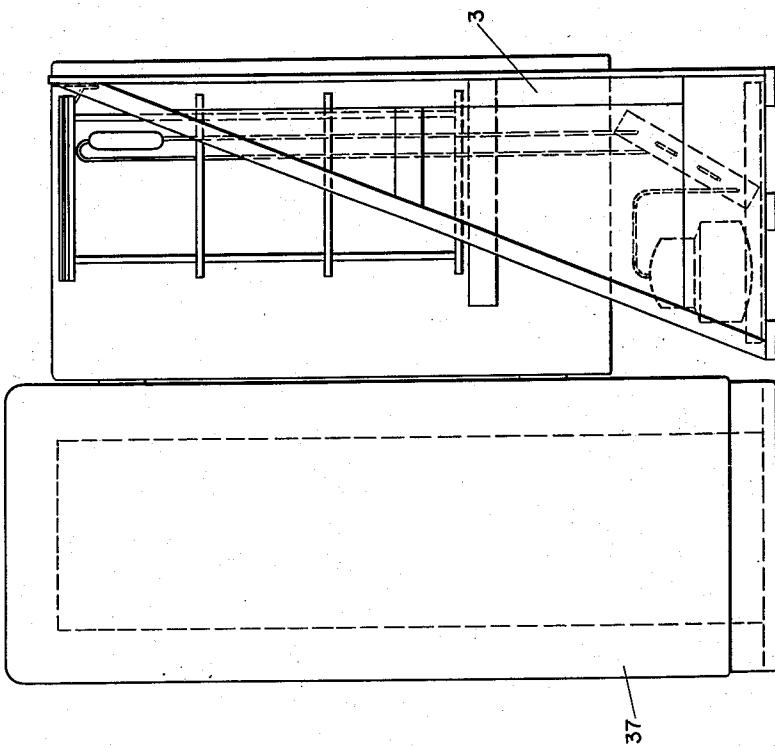


FIG. 3

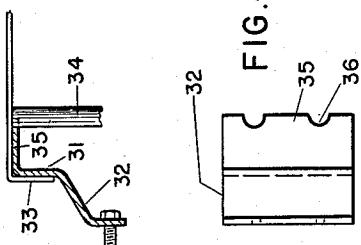


FIG. 4

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2,626,704

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Application June 9, 1949, Serial No. 98,148

7 Claims. (Cl. 206—46)

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This invention relates to shipping containers and more particularly, to a shipping container for a refrigeration system employed in freezers or refrigerators, a section of the container being adapted to hold the refrigeration system securely in place independently of a second section, the second section being removable from the container to serve as a support for a second refrigeration system to be removed from a refrigeration cabinet for a replacement.

Heretofore, customary practice in the refrigeration industry has been to ship refrigeration systems separately from the cabinets in which such systems were employed. The refrigeration systems were shipped in crates. If the refrigeration system was separated into its several components, no particular problem was created by replacement of such a system after it was disposed in a cabinet. Many small refrigeration systems today are hermetically sealed when manufactured. Such systems, when repairs are required, must be replaced with another complete system. Since such systems usually consist of a condensing unit connected to an evaporator by semi-flexible tubing, a problem exists in supporting the two interconnected assemblies both in shipment and during replacement. This is further complicated by the necessity of returning the defective system as a whole to a central repair station. Such returned systems are usually shipped to the repair station in the crate from which the new system has been removed. From the standpoint of the repairman making the replacement, this is a highly undesirable procedure because it necessitates that he obtain some support upon which the refrigeration system in the cabinet may be mounted upon removal. Customary practice has been to provide some auxiliary means of temporary support for the defective system until such time as the new system could be installed in the cabinet and leave room for the defective system in the crate. It will be appreciated such procedure is time consuming and costly.

The chief object of the present invention is to provide an economical shipping container for refrigeration systems which is so designed as to securely hold the refrigeration system as a unit during shipment and which may be opened to permit the refrigeration system to be easily removed and placed directly into a refrigeration cabinet in which such system will be employed. In addition, a section of the container may be reversed and employed as a support for a refrigeration system to be removed from the cabinet for replacement.

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An object of the present invention is to provide a shipping container for refrigeration systems composed of two similar sections, one of which may be employed as a support for a unit to be removed as an entity from a refrigeration cabinet; the other of which may be employed as a support for the new replacement unit to be disposed within the cabinet. The two sections may again be secured together to permit the defective unit to be returned to the factory for repair.

A further object is to provide a sectional shipping container in which each section is formed similarly and provided with supports to hold a refrigeration system securely in place during shipment and to support the same during removal of a unit from a refrigeration cabinet or during insertion of a unit within the refrigeration cabinet. Other objects of the invention will be readily perceived from the following description.

This invention relates to a shipping container for a refrigeration system employed in freezers or refrigerator cabinets which comprises in combination a first section of triangular contour in side elevation adapted to receive and support the refrigeration system, the base of the triangle forming the bottom of the section with the longest side of the triangle forming its front and the third side of the triangle forming its rear, and a second similar section adapted to complement the first section to form a rectangular container, the base of the triangle forming the second section comprising the top of the container, the longest side of such triangle being placed adjacent the longest side of the triangle formed by the first section, and fastening means securing the sections together to form the container.

The attached drawings illustrate a preferred embodiment of the invention, in which:

Figure 1 is an isometric view of a section of the rectangular container, the second section of the container being shown in dotted outline;

Figure 2 is an isometric view of a section of the container illustrating the refrigeration system placed therein;

Figure 3 is a fragmentary view in section illustrating the manner in which the evaporator is held in position in the container;

Figure 4 is a plan view of a clip used for securing the evaporator in position in the container; and

Figure 5 is a view in side elevation illustrating the manner in which a refrigeration unit may be disposed in a refrigeration cabinet.

Referring to the drawings, there is shown a rectangular container 2 composed of a first section 3 and a second section 4 secured together preferably by bolts 5 although any suitable fastening means may be employed to secure the two sections together.

Section 3 may be composed of fiber board or plywood walls 6, 7 and 8, wall 6 being the rear wall of the section and walls 7 and 8 composing the side walls of the section. Wall 9 forms the bottom of the section. The side walls 7 and 8 extend diagonally from the top of rear wall 6 downward and forward to bottom wall 9. Considering the section from side elevation, it is of right angled contour with the hypotenuse of the angle forming the front wall of the section the adjacent side forming the bottom of the section, and the third side of the triangle forming the rear wall of the section.

Corner braces 10 strengthen the rear and side walls of the section, likewise braces 11 strengthen the bottom of the section. Braces 12 extend along the front wall of the section from the rear wall 6 downward and forward to the bottom wall 9; if desired, reinforcing members 13 may be employed connecting braces 10 and braces 12. These various bracing members are disposed without the container wall although if desired they may be disposed within the container.

Within the container there are provided spaced base support members 14 forming a support for the base of the condenser and compressor-motor unit. Adjacent the rear corners of section 3 are securing members 15 having protruding portions 16 adapted to fit over and hold flanges (not shown) extending from the base of the compressor-motor condenser unit; adjacent the front of the section are pivotable holding members 17 each provided with a protruding portion 18 adapted to fit over and secure other flanges of the compressor-motor condenser base. Members 17 are pivoted at 19 so that they may be raised to permit removal of a refrigeration system after it has been disposed within the section. Members 17 are held securely in place when the second section 4 is secured to section 3 to form the rectangular container.

Referring to Figure 2, I have shown a refrigeration system disposed within section 3. Such refrigeration system comprises an evaporator 20 formed of a plurality of similar plates 21 connected by tubing 22 to a condenser 23 and a motor-compressor unit 24 mounted on a base 25 having flanges 26 which permit the base to be securely mounted in position in a refrigeration cabinet. Considering Figures 1 and 2, it will be observed that a support member 27 extends from side wall 7 to side wall 8 of the section. Support member 27 is mounted on boards 28 disposed at side walls 7 and 8 and extending horizontally of the section from the rear wall to the front wall. A support member 29 extends across the rear wall 6 adjacent the top of the section.

Clip members 30 are employed to fasten the evaporator in position in the section after it has been placed on support member 27. Members 30 include a flange 31 extending vertically from its body 32 and adapted to fit adjacent a downwardly extending flange 33 of a plate of evaporator 20. The various plates of the evaporator 20 are held together by means of rods 34. Member 30 is provided with a horizontally extending flange 35 extending from flange 31 adapted to extend 75

adjacent a plate and provided with notches 36 adapted to receive a rod 34. It will be observed, referring to Figure 2, that the clip members 30 may be bolted to member 29 to secure the evaporator in place against movement during shipping; in addition the rods 34 fitting within notches 36 of members 30 likewise aid in preventing movement of the evaporator during shipment.

The condenser motor-compressor unit mounted on its base 25 is placed adjacent the bottom of the section and rests on supports 14. Corner members 15 fit over flanges of base 25 and prevent upward movement of the same during shipping. Members 17 are rotated about point 19 until the portion 18 thereof fits over flange 26 of base 25 to hold the front portion of base 25 securely in position. It will be noted that the greater portion of evaporator 20 extends without section 3 while the condenser motor-compressor unit is disposed within the section. Section 4 is then disposed adjacent section 3. Section 4 is similar in contour to section 3 except that it is reversed. In this case the base of the triangle formed by section 4 composes the top of the container 2; its longest side extends downward to the apex of the triangle; the longest side of section 4 is disposed adjacent the longest side of section 3 to form the rectangular container. Any suitable fastening means may then be employed to secure the two sections together as a unit.

In Figure 5, I have illustrated the manner in which a replacement refrigeration system may be disposed in place in a refrigeration cabinet 37 designated generally at 37. It will be assumed section 4 of the container has been removed and utilized as a support for a refrigeration system removed from the cabinet 37. Considering Figure 5, it will be observed that section 3 of the container may be placed adjacent the refrigeration cabinet and is so designed that the evaporator 20 may be easily removed therefrom and inserted in its proper position within the refrigeration cabinet without separating the refrigeration system into its separate components; and the condenser compressor-motor unit may be removed from section 3 and disposed within the cabinet without separating it from the evaporator. A replacement refrigeration system may be easily and quickly disposed within a cabinet as a unit.

The present invention provides a shipping container for a refrigeration system which permits the refrigeration system to be shipped as a unit and to be disposed within a refrigeration cabinet as a unit. It is economical in design and is considerably less expensive than crates heretofore used for the purpose. An advantage of the present container resides in the fact that a section thereof may be removed and employed as a support for a refrigeration system removed from a cabinet in the field for return to the factory. In addition the container of the present invention provides a support which may be moved adjacent a refrigeration cabinet from which the refrigeration system may be readily removed and inserted within the refrigeration cabinet as a unit.

While I have described a preferred embodiment of the invention, it will be understood that the invention is not limited thereto since it may be otherwise embodied within the scope of the following claims.

I claim:

1. In combination, a shipping container, a

refrigeration system removably supported in said container, said refrigeration system including an evaporator connected by tubing to a condenser, and a motor-compressor unit mounted on a base having flanges to permit the base to be secured in place in a refrigerator cabinet, said container including a first section of triangular contour in side elevation, a member in said section supporting the evaporator, fastening means engaging a portion of the evaporator to hold the evaporator in place on said member, a member in the bottom of said section supporting the unit, spaced rear members in the bottom of the section having notches therein in which flanges of said base are disposed, said members having protruding portions fitting over said flanges, pivotable front securing members in the bottom of said section fitting over other flanges of said base, and a second similar section complementing the first section to complete the container.

2. In combination, a rectangular shipping container, a refrigeration system in said container, said refrigeration system including an evaporator connected by tubing to a condenser, and a motor-compressor unit mounted on a base having flanges to permit the base to be secured in place in a refrigerator cabinet, said container comprising a first section of triangular contour in side elevation, a member in said section supporting the evaporator, fastening means engaging a portion of the evaporator to hold the evaporator in place on said member, said evaporator being so disposed in place in the upper portion of said section that at least a portion thereof extends beyond the side walls of the section, a member in the bottom of said section supporting the unit base, rear corner members in the bottom of said section having notches therein in which flanges of said base are disposed, said members having protruding portions fitting over said flanges, pivotable front securing members in said section fitting over other flanges of said base, said members being disposed adjacent the front and the bottom of said section, and a second similar section complementing the first section to complete the rectangular container, said second section serving to hold the pivotable members in place when the sections are secured together and being adapted to serve as a support for a refrigeration system removed from a cabinet for replacement when the container is opened.

3. In combination, a rectangular shipping container, a refrigeration system placed in said container, said refrigeration system including an evaporator comprising a plurality of plates connected by rods disposed at the corners of the plates, the evaporator being connected by tubing to a condenser, and a motor-compressor unit mounted on a base having flanges to permit the base to be secured in place in the refrigerator cabinet, said container comprising a first section of triangular contour in side elevation, a member in said section supporting the evaporator, clip members engaging a portion of the evaporator to hold the evaporator in place on said member, each clip member being secured to the rear wall of the section, each clip member having a vertically extending flange placed adjacent a vertical flange of a plate and having a horizontally extending flange having a notch therein in which a rod connecting plates as a unit is disposed, the evaporator being so held in place in the upper portion of said section that at least a portion

thereof extends beyond the side walls of the section, spaced rear members in the bottom of said section supporting the unit base, said rear members in said section having notches therein in which flanges of said base are disposed, said rear members having protruding portions fitting over said flanges, pivotable front securing members in the bottom of said section fitting over other flanges of said base, and a second similar section complementing the first section to complete the rectangular container.

4. The combination according to claim 3 in which the second section is removable to serve as a support for a refrigeration system when it is removed from a refrigerator cabinet for replacement.

5. The combination according to claim 4 in which the first section includes spaced reinforcing members disposed at the bottom of the section, vertically extending reinforcing members disposed at the rear corners of the section, diagonally extending braces extending from the top of the section to the bottom thereof and strengthening the front wall of the section, and reinforcing members connecting the corner members and said diagonally extending braces.

6. In combination, an element of a shipping container for a refrigeration system, a refrigeration system placed in said element, said system including an evaporator connected by tubing to a condenser, and a motor-compressor unit mounted on a base having flanges to permit the base to be secured in place in a refrigerator cabinet, said element presenting the contour of a right triangle in side elevation and comprising a triangular section having the base of the triangle forming its bottom, the front of the section extending diagonally downward from the rear wall to the bottom, clip members engaging a portion of the evaporator to hold the evaporator in place in said section, a member supporting the evaporator, said supporting member extending from one side to the opposite side of the section, rear members in the bottom of said section fitting over flanges of the unit base to hold the unit base in place in the section, and pivotable front members in the bottom of said section fitting over other flanges of the unit base to hold the unit base in place in the section.

7. The combination according to claim 6 in which the element includes spaced reinforcing members at the bottom of the section, vertically extending reinforcing members at the rear corners of the section, diagonally extending braces for the section, and reinforcing members connecting the braces and the corner reinforcing members.

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